



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

DATE: June 22, 1999

SUBJECT: Oxydemeton-methyl (ODM) Anticipated Residues (ARs) for Chronic Dietary Risk Assessment and Chronic Dietary Exposure Analysis.
Chemical # 058702. DP Barcode No. D256714.

FROM: Sheila Piper, Chemist
Chemistry & Exposure Branch
Health Effects Division (7509C)

THROUGH: Francis B. Suhre, Branch Senior Scientist
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Health Effects Division (7509C)

TO: Paula Deschamp, Risk Assessor
Reregistration Branch II
Health Effects Division (7509C)

Action Requested

This memorandum describes anticipated residues (ARs) to be used in a chronic dietary risk assessment and summarizes the results of a Tier 3 chronic (non-cancer) dietary risk assessment for oxydemeton-methyl (ODM). Anticipated residues of ODM for purposes of chronic risk assessment were developed using residue data from available crop field trials and USDA pesticide monitoring data and FDA surveillance monitoring data for ODM and its metabolite oxydemeton-methyl sulfone (ODMS).

Executive Summary

Chronic dietary risk estimates based on the consumption of ODM residues at the high-end (Tier 1) of exposure (tolerance level residues without the use of percent crop treated) resulted in an estimated risk which exceeded HED's level of concern for all population subgroups. When chronic exposure estimates were compared to the ODM reference dose (RfD) of 0.0005 mg/kg/day, the resultant risk estimates range from 800% of the RfD for the general U.S. population to a high of 1,800% of the RfD for the population subgroup children 1-6 yrs old (R.Griffin, ODM Dietary Exposure and Risk Estimates for Reregistration, 11/97). As noted below, this RfD has been revised. The chronic dietary risk concerns using the DRES system prompted the registrant to conduct a Tier 3 probabilistic dietary risk analysis for ODM.

A refinement of the ODM risk assessment was completed using the following: average residue values from crop field trials, PDP and FDA pesticide monitoring data, and processing factors when available. Percent crop treated data were obtained from BEAD (I.Yusuf, 11/98). The Dietary Exposure Evaluation Model (DEEM™) using consumption data from the USDA CSFII, 1989-92 and a no observable adverse effect level (NOAEL) from a dog toxicity study (HIARC Document, 5/99) was used to estimate the chronic dietary risk. Based on this analysis, the dietary risk estimates associated with the consumption of ODM and ODMS residues in food **did not exceed HED's level of concern** for any population subgroup from chronic oral exposure.

DETAILED CONSIDERATIONS

Toxicological Information

For the chronic dietary exposure risk assessment, the dose selected was the no observable adverse effect level (NOAEL) of 0.0125 mg/kg BW/day based on plasma, erythrocyte and brain cholinesterase inhibition seen in a 1-year study in dogs. This dose and endpoint replaces the previous dose/endpoint based on the human study. Based on an uncertainty factor of 100x, the chronic RfD is 0.000125 mg/kg/day (J.Rowland, Draft-Replacement of Human Study Used in Risk Assessments, 5/99).

The additional 10x factor for the protection of infants and children as required by the Food Quality Protection Act (FQPA) of 1996 was retained for the acute and chronic RfD based on the concerns for heritable effects (J.Rowland, A Combined Report of the HIARC and the FQPA Safety Factor Committee, 8/6/98). Therefore, the chronic population adjusted dose (cPAD) is 0.0000125 mg/kg/day.

Consumption Database

For chronic dietary risk assessments, the three-day average of consumption for each sub-population is combined with residues in commodities to determine average exposure in mg/kg/day. HED conducts chronic dietary risk assessments using the Dietary Exposure Evaluation Model (DEEM™), which incorporates consumption data generated in USDA's Continuing Surveys of Food Intakes by Individual (CSFII), 1989-92.

Residue Information

Tolerances for residues of ODM are currently expressed in terms of ODM and its cholinesterase-inhibiting metabolites (40 CFR 180.330). For purposes of tolerance reassessment, ODM residues of concern in plants are ODM and oxydemeton-methyl sulfone (ODMS). Animal commodities determined to include ODM *per se* (HED Metabolism Committee (3/6/97)). The qualitative nature of the residue in plants and animals is adequately understood based on cabbage, sugar beets, and sweet corn metabolism studies and acceptable ruminant and poultry metabolism studies.

From the tolerance listing, apples, grapes, plums (prunes), and apricots have been excluded from the risk assessment since the use pattern for these commodities is considered to be a "nonfood" use (tolerances for these crops will be revoked as part of tolerance reassessment). Registrations for blackberries, raspberries, potatoes, and pears are now inactive and also have been excluded from the risk assessment (tolerances will be revoked). Citrus, field corn, popcorn, sorghum, safflower, onions, pears, turnips, and snap beans have been deleted from the current marketing labels (but NOT removed from the Manufacturing Use Product label). At the request of SRRD, these deleted commodities have been retained in this risk assessment. In addition to the above commodities, ODM risk assessment is based on strawberries, filberts, walnuts, pears, melons, cucurbits, peppers, broccoli, brussels sprouts, cabbage, cauliflower, sweet corn, sugar beets, cotton, mint, milk, and meat products. For chronic risk estimates, HED used mean residue values from field trials for cottonseed, eggplant, filbert, peppers, safflower, mint, strawberry, and sugar beets. A listing of field trials, source of data, average residues, maximum residues, percent crop treated, and anticipated residues are presented in Table 1.

Table 1: Anticipated Residues Derived from Field Trial Studies

Commodity	Data Source (MRID)	Average Residue (ppm)	Maximum Residue (ppm)	% Crop Treated (wtd avg)	Chronic Anticipated Residue (ppm)
Cottonseed	41085820	0.01	0.02	0*	0.0001
Eggplant	00107031	0.214	1.0	4	0.009
Filbert	00067459	0.005	0.01	4	0.0002
Hot Peppers	00107031 and 41085807	0.175	0.25	3	0.005
Safflower Seed	00107030	0.3	0.90	0*	0.003
Safflower Oil	00107030	0.005	0.01	0*	0.00005

Mint (Spearmint)	00037510	1.97	12.35	12	0.236
Mint Oil	00037506	0.097	0.2	12	0.012
Strawberry	41085812	0.06	0.179	8	0.005
Sweet Peppers	00107031 and 41085807	0.240	0.55	2	0.005
Sugar Beets	00095522, 00120079, and 41319001	0.039	0.1	0*	0.0004
Walnuts	00095522	0.05	0.1	1	0.0005
0*= Available EPA sources indicated that no usage is observed in the reported data for this site; HED used the default value of 1%.					

Cottonseed

The data set contained 6 samples from field trials conducted in TX (2), AZ, CA, and MS (2) at an application label rate of 2 x 0.50lb ai/A at a PHI of 14 days (MRID 41085820). Residues of ODM and ODMS ranged from (<0.01-0.02 ppm) in cotton and the average is 0.01 ppm. In the processing study, residues in cottonseed meal were 0.55x and residues in refined oil were <0.18x. The weighted average percent crop treated is 0% (default to 1). The chronic AR for cotton meal is 0.00005 ppm and 0.00002 ppm for cottonseed oil.

Eggplant

The data set contained 7 samples from field trials conducted in CA, MI, TX (2), OH, and SC (2) at an application label rate of 3 x 0.50lb ai/A at a PHI of 7 days (MRID 00107301). Residues of ODM and ODMS ranged from (<0.1-1.0 ppm) in eggplant and the average is 0.214 ppm. The weighted average percent crop treated is 4%. The chronic AR for eggplant is 0.009 ppm.

Filbert

The data set contained 9 samples from field trials conducted in OR at various application rates (MRID 00067459). The label rate is 0.0055lb ai/inch trunk diameter. Residues of ODM and ODMS were all below the LOQ (<0.01 ppm) in filberts. The weighted average percent crop treated is 4%. The chronic AR for filbert is 0.0002 ppm.

Peppers

Sweet Pepper:

The data set contained 11 samples from field trials conducted in OH, FL (3), NY, CA (3), MS, TX, and NJ at an application label rate of 2 x 0.50lb ai/A at a PHI of 3 days (MRIDs 00107301 and 41085807). Residues of ODM and ODMS ranged from (<0.05-0.55 ppm) in sweet pepper

and the average is 0.240 ppm. The weighted average percent crop treated is 2%. The chronic AR for sweet peppers is 0.005 ppm.

Hot Pepper:

The data set contained 4 samples from field trials conducted in NY, CA, and TX (2) at an application label rate of 2 x 0.50lb ai/A at a PHI of 3 days (MRIDs 00107301 and 41085807). Residues of ODM and ODMS ranged from (<0.1- 0.25 ppm) in hot peppers and the average is 0.175 ppm. The weighted average percent crop treated is 3% (other peppers). The chronic AR for hot peppers is 0.005 ppm.

Mint

The data set contained 11 samples from field trials conducted in MI (2), MO (6) and WA (3) at an application label rate of 2 x 0.75lb ai/A at a PHI of 14 days (MRIDs 00037506 and 00037510). Residues of ODM and ODMS ranged from (<0.01- 12.35 ppm) in spearmint and the average is 1.97 ppm. Residues in mint oil ranged from (<0.01- 0.2 ppm) and the average is 0.097 ppm. The weighted average percent crop treated is 12%. The chronic AR for spearmint/ peppermint is 0.236 ppm and 0.012 for spearmint/peppermint oil.

Safflower

The data set contained 4 samples from field trials conducted in AZ (2) and CA (2) at an application label rate of 3 x 16 oz/A at a PHI of 6/ 7 days (MRID 00107030). Residues of ODM and ODMS ranged from (0.03 -0.90 ppm) in safflower and the average is 0.3 ppm. In the processing study, residues in safflower seed is 0.02 ppm and safflower oil <0.01 ppm. HED will use 0.05 as the processing factor for safflower oil. The weighted average percent crop treated is 0% (default of 1). The chronic AR for safflower seed is 0.003 ppm and safflower oil is 0.00005 ppm.

Strawberry

The data set contained 4 samples from field trials conducted in CA (2), NY, and IN at an application label rate of 2 x 0.5lb ai/A at a PHI of 14 days (MRID 41085812). Residues of ODM and ODMS ranged from (0.03-1.43 ppm). This registered use of ODM on strawberries is in support of a Section 24(c) special local need registration in Oregon and the use pattern involves either pre-bloom or postharvest application when fruit is not present. The registrant provided a decline study that showed the predicted residues at a 30 day PHI (appropriately the time between bloom and harvest). HED has no objection to Gowan's assumption that ODM and ODMS residues ranged from (0.01- 0.179 ppm) for their 30-day PHI and the average is 0.06 ppm. The weighted average percent crop treated is 8%. The chronic AR for strawberries is 0.005 ppm.

Sugar Beets

The data set contained 7 samples from field trials conducted in Canada (4), CA, NB, and WA at various application rates (MRIDs 00095522, 00120079, and 41319001). The label rate is 3 x 0.75lb ai/A at a PHI of 30 days. Residues of ODM and ODMS were below the LOQ <0.1 ppm in Canada and <0.05ppm for the United States for sugar beets. The weighted average percent crop

treated is 0% (default of 1). The chronic AR for sugar beets is 0.0004 ppm.

Walnut

The data set contained 7 samples from field trials conducted in CA at various application rates (MRID 00095522). The label rate is 0/375lb ai/100 gal x 400 gal/A. Residues of ODM and ODMS were below the LOQ (<0.1 ppm) in walnuts. The weighted average percent crop treated is 1%. The chronic AR for walnuts is 0.0005 ppm.

FDA and PDP monitoring data for parent and/or ODMS are available for broccoli, cabbage, cantaloupe, cauliflower, cucumber, grapefruit, green beans, field corn, lettuce, onion, orange, pear, squash, sweet corn, and watermelon. Brussel Sprouts was translated to broccoli; pumpkin was translated to cucumber; sugarbeets was translated to turnips; and greenbeans was translated to lima beans (G.Markle, J.Baron, BA.Schneider, Foods and Feed Crops of the U.S., HED SOP 99.3). All FDA and PDP monitoring data were reported as non-detects and were assigned half the LOD for that portion of the crop which was treated, and zero for that portion of the crop that was not treated. When choosing which data set to use for a dietary risk assessment, the order of preference is generally PDP data > FDA data > field trial data. A listing of the commodity, processed forms, and concentration/dilution factor is presented in Table 2.

Table 2: Anticipated Residues Derived from Monitoring Data

Commodity	Data Source	No. of Samples	No. of Detects	LOD (ppm)	% Crop Treated (wtd avg)	Mean Residue Value (ppm) ¹
Broccoli	FDA,(1992-97)	277	0	0.003	60	0.0009
Cabbage	FDA,(1992-97)	439	0	0.003	10	0.00015
Cantaloupe	FDA,(1992-97)	271	0	0.003	12	0.00018
Cauliflower	FDA,(1992-97)	204	0	0.003	59	0.00088
Cucumber	FDA,(1992-97)	1097	0	0.003	2	0.00003
Grapefruit	FDA,(1992-97)	111	0	0.003	0*	0.000014
Green Beans	PDP,(1996-97)	127	0	0.003	0*	0.000012
Field Corn	FDA,(1992-97)	141	0	0.003	0*	0.0015
Lettuce	FDA (1992-97)	520	0	0.003	4	0.00006
Milk	PDP, (1996-97)	315	0	0.003	--	0.000014
Onion	FDA,(1992-97)	216	0	0.003	2	0.00003
Orange	FDA,(1992-97)	576	0	0.003	0*	0.000015

Orange Juice	PDP, (1997)	108	0	0.003	0*	0.000014
Pears	PDP, (1997)	108	0	0.003	0*	0.000014
Squash	FDA,(1992-97)	435	0	0.003	6	0.00009
Sweet Corn	FDA,(1992-97)	689	0	0.003	0*	0.000015
Watermelon	FDA,(1992-97)	321	0	0.003	1	0.000014
<p>0*= Available EPA sources indicated that no usage is observed in the reported data for this site; HED used the default value of 1%.</p> <p>¹=All FDA and PDP monitoring data were reported as non-detects and were assigned half the LOD for that portion of the crop which was treated, and zero for that portion of the crop that was not treated.</p>						

Processing studies are available for broccoli, citrus, cottonseed, and safflower. Processing factors were calculated based on parent ODM residues. A listing of the commodity, source of data, processed commodity and concentration/dilution factor is presented in Table 3.

Table 3: Anticipated Residues Reflecting Processing Factors		
Food Item (Data Source)	Processed Form	Concentration or Dilution Factor
Broccoli, Brussel Sprouts, Cabbage, and Cauliflower (MRID 44589601)	Cooked	0.207
Cottonseed (MRID 41288902)	Meal	0.5
	Oil	0.2
Safflower (MRIDs 00038078, 00038082)	Meal	0.05
	Oil	0.05

Meat and Milk:

Potential transfer of pesticide residues from treated feed items to livestock commodities are estimated by calculating a livestock dietary burden and conducting livestock feed studies at the appropriate dose level. For ODM, HED has previously estimated a dietary burden to cattle and reviewed appropriate livestock feeding studies (B.Cropp-Kohlligian, D240964, 11/25/97). The maximum theoretical dietary burden of ODM to beef and dairy cattle is 10.3 ppm and 10.4 ppm, respectively. See Table 4.

Table 4: Calculation of maximum ruminant dietary burden for ODM.

Feed Commodity	Tolerance (ppm)	% Dry Matter	Beef Cattle		Dairy Cattle	
			% of Diet	Burden (ppm)	% of Diet	Burden (ppm)
Alfalfa, forage ^a	5	35	70	10.00	--	--
Clover, forage ^a	5	30	--	--	60	10.00
Sorghum, grain	0.75	86	20	0.17	20	0.17
Dried citrus pulp ^b	1	91	10	0.11	20	0.22
TOTAL			100	10.3	100	10.4
^a Reviewer used the currently established tolerances on alfalfa, green and clover and green.						
^b Reviewer used the currently established tolerance on oranges.						

Two dairy cattle feeding studies were submitted under reregistration. In the first (1972; MRID 00036273), 2 groups of 3 animals each were orally dosed with ODM at 10.8 ppm (ca. 1x the maximum dietary burden to dairy cattle) or 32.4 ppm (3.1x the maximum dietary burden to dairy cattle) via capsules for 27-28 days. Total residues of ODM and ODMS in milk ranged from <0.001 - 0.008 ppm (average residue 0.004 ppm) and 0.011 - 0.019 ppm (average residue 0.015 ppm) reflecting the 10.8 ppm and 32.4 ppm doses, respectively. Data were collected using a GLC with phosphorus-sensitive thermionic detection analytical method (Method No. 35409) deemed adequate for data collection and having a LOQ of 0.005 ppm. Based on this study, the reviewer calculates the anticipated residue level of ODM likely to be found in milk resulting from currently registered uses of ODM at 0.004 ppm (average residue level found in milk resulting from dosing at ca. 1x the maximum dietary burden to dairy cattle for 27-28 days).

In the second study (1987; MRID 40404908), 2 groups of 3 animals each were orally dosed with ODM at 10 ppm (ca. 1x the maximum dietary burden to dairy cattle) or 30 ppm (2.9x the maximum dietary burden to dairy cattle) for 28 days. Total residues of ODM and ODMS were nondetectable (<0.01 ppm) in all milk samples. Data were collected using a GLC/NPD analytical method (Method No. 94896) deemed adequate for data collection having a LOQ of 0.01 ppm. Based on this study, the reviewer calculates the anticipated residue level of ODM likely to be found in milk resulting from currently registered use of ODM at 0.004 ppm (0.01 ppm residues found in milk resulting from dosing at 2.9x the maximum dietary burden to dairy cattle for 28 days). Total residues of ODM were non-detectable (<0.01) in fat, muscle, kidney, and liver of the beef and dairy cattle. Anticipated residues for fat, meat, and meat byproducts of cattle, goats, hogs, horses, and sheep is 0.00002 ppm ($\frac{1}{2}$ LOQ/3 X %CT).

For the purposes of this chronic dietary risk assessment, HED will use PDP data (1996-97) for milk which shows non-detects at the LOD (0.003), the anticipated residue for milk is 0.000014 ppm. See Table 2.

Poultry and Eggs:

Data from a previously submitted poultry feeding study were reviewed (CBRS Nos. 5172 and 5173, J. Garbus, 1/4/90) and deemed inadequate because the registrant failed to provide all the necessary raw data. Samples were not analyzed and raw data were not provided for some of the egg and poultry tissue samples. In addition, the dose levels in the study were imprecise and inaccurate and actual feeding levels were unknown because unused feed was not quantified. Residues of ODM and ODMS were <0.01 ppm in eggs from all sample intervals and reported dose levels (0.65, 1.95, and 6.5 ppm); residues were <0.01 ppm in tissues from hens dosed at 6.5 ppm in the feed.

Table 5: Calculation of maximum poultry dietary burden for ODM.

Feed Commodity	Reassessed Tolerance (ppm)	Poultry	
		% of Diet	Burden (ppm)
Alfalfa, meal	11.0 ^a	10	1.10
Safflower, meal	1.0 ^b	10	0.10
Sorghum, grain	0.75	80	0.60
TOTAL		100	1.70
^a Using the currently established tolerance on alfalfa, hay, for seed. Additional field trial data are required to reassess this tolerance. ^b Using the reassessed tolerance on safflower, seed.			

A new poultry feeding study is not required to support reregistration of ODM because no residues of toxicological concern were found in poultry commodities in a metabolism study conducted at a 6x feeding level. However, because these findings contrast with results of an earlier poultry metabolism study where ODM was present in eggs and tissues, HED cannot conclude that there is no reasonable expectation of finite residues in poultry meat and eggs. Therefore, tolerances for residues of ODM at the quantification limit of the method (0.01 ppm) in eggs and poultry fat, meat, and meat byproducts must be established. To further refine the chronic dietary assessment, HED used the ratio from the 6.5x feeding level, and calculated the anticipated residues in poultry and eggs at 0.00002 ppm ($\frac{1}{2}\text{LOQ}/3 \times \% \text{CT}$).

Percent Crop Treated

The Biological and Economic Analysis Division (BEAD) prepared an ODM quantitative usage analysis (QUA, I.Yusuf, 11/10/98) using data from 1987-1996. HED is currently applying the weighted average percent crop treated to refine chronic analyses. Note that in the past, HED conducted dietary exposure analyses in which the BEAD estimated maximum percent crop treated for both chronic and acute dietary exposure/risk analysis. Also, it should be noted that data indicated no ODM use on several commodities (grapefruit, green beans, field corn, oranges, pears, sweet corn, cottonseed, and sugar beets). However, to be consistent with other HED risk assessments, all commodities are assessed with a default minimum assumption of 1% crop treated (See Tables 1 and 2).

Results/Discussion

Results of HED's chronic dietary risk estimates for ODM using the average consumption data from CSFII 1989-92, latest percent crop treated data, anticipated residues, average residues from field trial data and/or monitoring data, and residue reduction/concentration upon processing, are shown below. Chronic dietary exposures for the U.S. population and selected subgroups are presented in Table 6.

Table 6: Chronic Dietary Exposure Results for ODM.

Subgroups	Exposure (mg/kg/day)	Chronic Risk (% cPAD) ¹
U.S. Population (total)	0.000003	20%
Non-nursing infants	0.000007	53%
Children (1-6 years old)	0.000006	45%
Children (7-12 years old)	0.000004	33%
Females (13-19 years old/not preg. or nursing)	0.000002	19%
Males (13-19 years old)	0.000003	22%
¹ The chronic population adjusted dose (cPAD) is 0.0000125 mg/kg/day.		

Conclusion

A refined (Tier 3) chronic (non-cancer) risk estimates associated with the consumption of ODM and its metabolite ODMS in food did not **exceed HED's level of concern** for any population subgroup.

List of Attachments

Attachment 1: Chronic Residue Information

Attachment 2: Chronic DEEM™ Analysis (S.Piper, 6/22/99)

cc: L.Richardson (CEB1), ODM SF, RF.

RDI: ChemSAC: 6/16/99, Dietary SAC [Secondary Reviewers: R.Griffin, F.Fort 6/18/99]

7509C: CEB1: CM-2: Rm 810F: 308-2717: Oxydemeton-methyl

ATTACHMENT 1: Chronic Residue Information

U.S. Environmental Protection Agency Ver. 6.76
 DEEM Chronic analysis for OXYDEMETON-METHYL 1989-92 data
 Residue file: C:\deem\odm\odmcc.R96 Adjust. #2 used
 Analysis Date 06-22-1999 Residue file dated: 06-22-1999/20:17:11/8
 Reference dose (RfD) = 0.000013 mg/kg bw/day

Food Crop			RESIDUE	Adj.Factors	
Code	Grp	Food Name	(ppm)	#1	#2
17	O	Strawberries			
		11-Uncooked	0.060000	1.000	0.080
		12-Cooked: NFS	0.060000	1.000	0.080
		13-Baked	0.060000	1.000	0.080
		14-Boiled	0.060000	1.000	0.080
		31-Canned: NFS	0.060000	1.000	0.080
		34-Canned: Boiled	0.060000	1.000	0.080
		41-Frozen: NFS	0.060000	1.000	0.080
22	10	Grapefruit-peeled fruit	0.000014	1.000	1.000
23	10	Grapefruit-juice	0.000014	2.100	1.000
26	10	Lemons-peeled fruit	0.000015	1.000	1.000
27	10	Lemons-peel	0.000015	1.000	1.000
28	10	Lemons-juice	0.000015	2.000	1.000
33	10	Oranges-juice-concentrate	0.000014	1.860	1.000
34	10	Oranges-peeled fruit	0.000015	1.000	1.000
35	10	Oranges-peel	0.000015	1.000	1.000
36	10	Oranges-juice	0.000014	1.800	1.000
44	14	Filberts (hazelnuts)	0.000200	1.000	0.030
48	14	Walnuts	0.050000	1.000	0.010
56	11	Pears	0.000014	1.000	1.000
57	11	Pears-dried	0.000014	6.250	1.000
141	9A	Melons-cantaloupes-juice	0.000180	1.000	1.000
142	9A	Melons-cantaloupes-pulp	0.000180	1.000	1.000
147	9A	Watermelon	0.000014	1.000	1.000
148	9B	Cucumbers	0.000030	1.000	1.000
149	9B	Pumpkin	0.000030	1.000	1.000
150	9B	Squash-summer	0.000090	1.000	1.000
151	9B	Squash-winter	0.000090	1.000	1.000
154	8	Eggplant	0.210000	1.000	0.040
155	8	Peppers-sweet (garden)	0.240000	1.000	0.020

157	8	Peppers-other	0.175000	1.000	0.030
168	5A	Broccoli	0.000900	0.207	1.000
169	5A	Brussels sprouts	0.000900	0.207	1.000
170	5A	Cabbage-green and red	0.000150	1.000	1.000
171	5A	Cauliflower	0.000880	0.207	1.000
176	4A	Lettuce-leafy varieties	0.000060	1.000	1.000
182	4A	Lettuce-unspecified	0.000060	1.000	1.000
188	2	Turnips-tops	0.039000	1.000	0.010
192	4A	Lettuce-head varieties	0.000060	1.000	1.000
205	3	Onions-dry-bulb (cipollini)	0.000030	1.000	1.000
206	3	Onions-dehydrated or dried	0.000030	9.000	1.000
233	6B	Beans-succulent-lima	0.000012	1.000	1.000
234	6A	Beans-succulent-green	0.000012	1.000	1.000
235	6A	Beans-succulent-other	0.000012	1.000	1.000
236	6A	Beans-succulent-yellow/wax	0.000012	1.000	1.000
237	15	Corn/pop	0.001500	1.000	1.000
238	15	Corn/sweet	0.000015	1.000	1.000
250	6B	Beans-succulent-broadbeans	0.000012	1.000	1.000
257		Beans-succulent-hyacinth	0.000012	1.000	1.000
262	3	Onions-green	0.000030	1.000	1.000
266	15	Corn grain-endosperm	0.001500	1.000	1.000
267	15	Corn grain-bran	0.001500	1.000	1.000
268	15	Corn grain/sugar/hfcs	0.001500	1.500	1.000
282	1A	Sugar-beet	0.039000	1.000	0.010
289	15	Corn grain-oil	0.001500	1.000	1.000
290	O	Cottonseed-oil	0.010000	0.200	0.010
291	O	Cottonseed-meal	0.010000	0.500	0.010
294	O	Safflower-seed	0.003000	1.000	0.010
295	O	Safflower-oil	0.000050	0.050	0.010
310	O	Peppermint	0.236000	1.000	1.000
311	O	Peppermint-oil	0.012000	1.000	1.000
312	O	Spearmint	0.236000	1.000	1.000
313	O	Spearmint-oil	0.012000	1.000	1.000
318	D	Milk-nonfat solids	0.000014	1.000	1.000
319	D	Milk-fat solids	0.000014	1.000	1.000
320	D	Milk sugar (lactose)	0.000014	1.000	1.000
321	M	Beef-meat byproducts	0.000020	1.000	1.000
322	M	Beef-other organ meats	0.000020	1.000	1.000
323	M	Beef-dried	0.000020	1.920	1.000
324	M	Beef-fat w/o bones	0.000020	1.000	1.000
325	M	Beef-kidney	0.000020	1.000	1.000
326	M	Beef-liver	0.000020	1.000	1.000
327	M	Beef-lean (fat/free) w/o bones	0.000020	1.000	1.000
328	M	Goat-meat byproducts	0.000020	1.000	1.000
329	M	Goat-other organ meats	0.000020	1.000	1.000
330	M	Goat-fat w/o bone	0.000020	1.000	1.000
331	M	Goat-kidney	0.000020	1.000	1.000
332	M	Goat-liver	0.000020	1.000	1.000
333	M	Goat-lean (fat/free) w/o bone	0.000020	1.000	1.000
334	M	Horsemeat	0.000020	1.000	1.000
336	M	Sheep-meat byproducts	0.000020	1.000	1.000
337	M	Sheep-other organ meats	0.000020	1.000	1.000
338	M	Sheep-fat w/o bone	0.000020	1.000	1.000
339	M	Sheep-kidney	0.000020	1.000	1.000
340	M	Sheep-liver	0.000020	1.000	1.000
341	M	Sheep-lean (fat free) w/o bone	0.000020	1.000	1.000
342	M	Pork-meat byproducts	0.000020	1.000	1.000
343	M	Pork-other organ meats	0.000020	1.000	1.000
344	M	Pork-fat w/o bone	0.000020	1.000	1.000
345	M	Pork-kidney	0.000020	1.000	1.000
346	M	Pork-liver	0.000020	1.000	1.000
347	M	Pork-lean (fat free) w/o bone	0.000020	1.000	1.000
356	P	Turkey-giblets (liver)	0.000020	1.000	1.000
357	P	Turkey--fat w/o bones	0.000020	1.000	1.000
358	P	Turkey- lean/fat free w/o bones	0.000020	1.000	1.000
360	P	Poultry-other-lean (fat free) w/	0.000020	1.000	1.000

361 P	Poultry-other-giblets(liver)	0.000020	1.000	1.000
362 P	Poultry-other-fat w/o bones	0.000020	1.000	1.000
363 P	Eggs-whole	0.000020	1.000	1.000
364 P	Eggs-white only	0.000020	1.000	1.000
365 P	Eggs-yolk only	0.000020	1.000	1.000
366 P	Chicken-byproducts	0.000020	1.000	1.000
367 P	Chicken-giblets(liver)	0.000020	1.000	1.000
368 P	Chicken-fat w/o bones	0.000020	1.000	1.000
369 P	Chicken-lean/fat free w/o bones	0.000020	1.000	1.000
379 1A	Sugar-beet-molasses	0.039000	1.000	0.010
383 5B	Cabbage-savoy	0.000150	1.000	1.000
385 P	Chicken-giblets (excl. liver)	0.000030	1.000	1.000
388 15	Corn grain/sugar-molasses	0.001500	1.500	1.000
398 D	Milk-based water	0.000014	1.000	1.000
404 11	Pears-juice	0.000014	1.000	1.000
415 9B	Squash-spaghetti	0.000090	1.000	1.000
416 O	Strawberries-juice	0.060000	1.000	0.080
424 M	Veal-fat w/o bones	0.000020	1.000	1.000
425 M	Veal-lean (fat free) w/o bones	0.000020	1.000	1.000
426 M	Veal-kidney	0.000020	1.000	1.000
427 M	Veal-liver	0.000020	1.000	1.000
428 M	Veal-other organ meats	0.000020	1.000	1.000
429 M	Veal-dried	0.000020	1.920	1.000
430 M	Veal-meat byproducts	0.000020	1.000	1.000
431 14	Walnut oil	0.050000	1.000	0.010
436 9A	Watermelon-juice	0.000014	1.000	1.000
441 10	Grapefruit-juice-concentrate	0.000014	0.127	1.000
442 10	Lemons-juice-concentrate	0.000015	0.088	1.000
448 10	Grapefruit peel	0.000014	1.000	1.000
449 P	Turkey-other organ meats	0.000020	1.000	1.000

ATTACHMENT 2: Chronic DEEM Analysis

U.S. Environmental Protection Agency Ver. 6.76
 DEEM Chronic analysis for OXYDEMETON-METHYL (1989-92 data)
 Residue file name: C:\deem\odm\odmcc.R96 Adjustment factor #2 used.
 Analysis Date 06-22-1999/20:18:02 Residue file dated: 06-22-1999/20:17:11/8
 Reference dose (RfD, CHRONIC) = .000013 mg/kg bw/day

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Total exposure by population subgroup	

	Total Exposure

Population Subgroup	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000003	19.9%
U.S. Population (spring season)	0.000003	22.1%
U.S. Population (summer season)	0.000003	20.2%
U.S. Population (autumn season)	0.000003	19.4%
U.S. Population (winter season)	0.000002	17.8%
Northeast region	0.000003	19.8%
Midwest region	0.000003	20.7%
Southern region	0.000003	19.8%
Western region	0.000002	19.0%
Hispanics	0.000003	19.5%
Non-hispanic whites	0.000003	19.5%
Non-hispanic blacks	0.000003	21.3%
Non-hisp/non-white/non-black)	0.000003	24.2%
All infants (< 1 year)	0.000005	39.9%
Nursing infants	0.000001	9.8%
Non-nursing infants	0.000007	52.5%
Children 1-6 yrs	0.000006	45.3%
Children 7-12 yrs	0.000004	33.2%
Females 13-19(not preg or nursing)	0.000002	18.7%
Females 20+ (not preg or nursing)	0.000002	13.9%
Females 13-50 yrs	0.000002	15.1%
Females 13+ (preg/not nursing)	0.000002	14.0%
Females 13+ (nursing)	0.000002	19.1%
Males 13-19 yrs	0.000003	22.4%
Males 20+ yrs	0.000002	14.4%
Seniors 55+	0.000002	12.9%
Pacific Region	0.000002	18.1%